

CLAIMS

What is claimed is:

1. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process comprising the steps of:
 - (a) preparing a silicon carbide fibers solution;
 - (b) preparing a pollen germination medium;
 - (c) preparing a DNA solution;
 - (d) preparing a mixture by mixing said silicon carbide fibers solution and said pollen germination medium with said DNA solution;
 - (e) adding fresh pollens into said mixture to form a paste;
 - (f) vortexing said paste for a time interval of 30-60 seconds;
 - (g) applying said paste for pollination; and
 - (h) selecting for transformants.
2. A method for genetic transformation transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1, wherein said silicon carbide fibers are approximately 0.1- 20 μm average diameter and 1 - 250 μm length.
3. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1, wherein the preferred size of said silicon carbide fibers is 1-2 μm diameter and 10 - 80 μm length.
4. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1,

wherein an aqueous solution for silicon carbide fibers is prepared by adding sterile water or solvent to said fibers.

5. A method for genetic transformation transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 4, wherein said solution is 5% to 25% aqueous solution.

6. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1, wherein said pollen germination medium is a solution containing about 5% - 15% sucrose, 0.01% - 1.0% H_3BO_3 , 0.01% to 1.0% $Ca(NO_3)_2 \cdot 4H_2O$ at pH 5.6.

7. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1, wherein said preferred pollen germination medium is a solution containing about 15% sucrose, 0.018% H_3BO_3 , 0.04% $Ca(NO_3)_2 \cdot 4H_2O$ at pH 5.6.

8. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1, wherein said DNA is a plasmid DNA.

9. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 8, wherein said plasmid DNA is dissolved in a TE solution.

10. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1, wherein said DNA solution is further incubated at about 20 -25°C.

11. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1, wherein the selection of a transformate is performed by specific cloned selectable markers having a phenotypic expression or providing resistance to some drugs.

12. A method for genetic transformation according to claim 11, wherein said selectable marker having a phenotypic expression is an anthocyanin regulator.

13. A method for genetic transformation according to claim 11, wherein said selectable markers providing resistance to some drugs are antibiotics or herbicides.

14. A method for genetic transformation according to claim 11, wherein said selectable markers providing resistance to antibiotics is neomycin phosphotransferase gene.

15. A method for genetic transformation according to claim 11, wherein said selectable markers providing resistance to antibiotics is kanamycin gene.

16. A method for genetic transformation according to claim 11, wherein said selectable markers providing resistance to herbicides is phosphinothricin acetyltransferase gene.

17. A method for genetic transformation of any plant species with sexual reproduction based on a pollination-fecundation process according to claim 1, in any plant species with sexual reproduction comprising flowering plants and gymnosperms.

18. A method for genetic transformation according to claim 17, wherein said flowering plants are selected from a group consisting of monocots.

19. A method for genetic transformation according to claim 18, wherein said monocots is maize.

20. A method for genetic transformation according to claim 17, wherein said flowering plants are selected from a group consisting of dicots.

21. A method for genetic transformation according to claim 20, wherein said dicots are melon and tomato.

22. A method for genetic transformation according to claim 17, wherein said gymnosperms is pine.

23. A transgenic maize having an antibiotic kanamycin resistant property prepared by the process of claim 1.

24. A transgenic maize having a herbicide bialaphos resistant property prepared by the process of claim 1.

25. A transgenic maize having an anthocyanin producing property prepared by the process of claim 1.

26. A paste comprising a silicon carbide fiber, a pollen germination medium, and a purified and isolated DNA molecule.

27. A paste as recited in claim 26 wherein said silicon carbide fibers having 1-2 μm average diameter and 10-80 μm length.

28. A paste as recited in claim 26 wherein said silicon carbide fibers is a 5% aqueous solution.

29. A paste as recited in claim 26 wherein said pollen germination medium is a solution containing about 15% sucrose, 0.018% H_3BO_3 , 0.04% $Ca(NO_3)_2 \cdot 4H_2O$ at pH 5.6.

30. A paste as recited in claim 26 wherein said DNA is a plasmid DNA.

31. A method for genetic transformation of maize reproducing sexually, said method comprising of a pollination-fecundation process and comprising the steps of:

- (a) preparing a silicon carbide fiber solution;
- (b) preparing a pollen germination medium;
- (c) preparing a DNA solution;
- (d) mixing said silicon carbon fibers with pollen germination medium and said DNA solution to form a mixture;
- (e) adding fresh pollen into said mixture to form a paste;
- (f) vortexing said paste for 30 to 60 seconds;
- (g) applying said past formed in step (e) on silks for pollination;
- and
- (h) selecting for transformants.

32. The method of Claim 31, wherein said silicon fibers used in step (a) are approximately 0.1-20 μm in diameter (and 1-250 μm in length, and more preferably between 1-2 μm in diameter) and 10-80 μm in length.

33. The method of Claim 31 wherein the solution of silicon carbide fibers prepared in step (a) comprises a sufficient amount of sterile water or solvent, to make a 5% to 25% aqueous solution.

34. The method of Claim 31 wherein the pollen germination medium contains about 5% - 15% sucrose, 0.01% - 1.0% H_3BO_3 , 0.01% to 1.0% $Ca(NO_3)_2 \cdot 4H_2O$ at pH 5.6, and more preferably, about 15% sucrose, 0.018% H_3BO_3 , 0.04% $Ca(NO_3)_2 \cdot 4H_2O$ at pH 5.6.

35. The method of Claim 31 wherein said DNA is a plasmid DNA.

36. The method of Claim 35, wherein said plasmid DNA is dissolved in a Tris EDTA solution.

37. The method of Claim 31, wherein the selection of a transformant is performed by using specific cloned selectable markers selected from the group consisting of antibiotics and herbicides.

38. The method of Claim 37, wherein said selectable marker is a gene providing resistance to neomycin phosphotransferase.

39. The method of Claim 37, wherein said selectable marker is a gene providing resistance to kanamycin.

40. The method of Claim 37, wherein said selectable marker is gene providing resistance to phosphinothriun acetyltransferase.